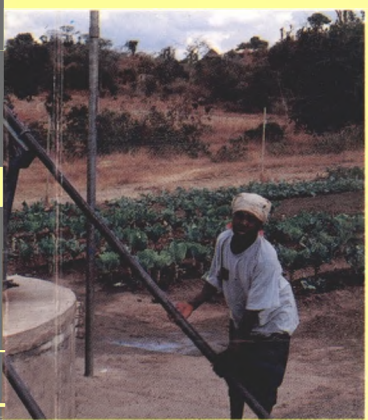
Smallholder Horticulture in ZIMBABWE



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RESOURCE USE AND ENVIRONMENTAL SUSTAINABILITY: HORTICULTURE IN RELATION TO OTHER FORMS OF LAND WATER AND HUMAN-RESOURCE USAGE AND IMPACT ON WATER RESOURCES AND SOIL EROSION

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ABSTRACT

Smallholder commercial horticulture programmes aimed at the production of coffee, fruit and other vegetables were introduced into Zimbabwe at Independence in 1980 as one of the Government of Zimbabwe's major goals of creating employment among communal people through agricultural activity.

The Eastern Highlands Communal Areas were chosen as pilot areas for this purpose. Funding was obtained from the European Economic Community (EEC) and management has been by the Agricultural and Rural Development Authority (ARDA).

There is very serious pressure for land in the communal areas today and this is likely to increase with the increase in population. In the ARDA project areas, land holding sizes average about 1.3 ha per household and therefore the use of intensive methods of farming becomes imperative if the communal land dwellers are going to depend on the land for survival. The pressure on this land has made it even more vulnerable to damage as land unsuitable for cultivation is used for this purpose and the clearing of vegetation for wood and for cultivation has only worsened the situation. This has necessitated the use of more elaborate and labour intensive methods of soil conservation but we have also, through experience gained in our project field work, realized that labour, in spite of growing population, is not as abundant in communal areas as one would be made to believe. This apparent shortage of labour also exacerbates the situation.

The pressure on land and the inadequacy of the present conservation works has also affected the availability of water for agricultural purposes through the siltation of the rivers and streams during the rainy season. The recent droughts have only worsened the situation.

So in general, it can be said that in the ARDA project areas as well as in the other communal areas of Zimbabwe there is a major problem of the allocation and effective utilisation of scarce resources in the form of soil, water and (apparently) also labour.

One of the possible solutions to this problem is more intensive land utilisation. Horticultural production is normally done under intensive conditions and in Zimbabwe needs irrigation. Since under irrigation systems it is not easy to shift from one piece of land to another, once communal farmers are engaged in this type of farming they

will have no option but to conserve their soil and water resource. The present pressure on land means that movement is made more difficult if not impossible in future. So horticultural production under these conditions will become a useful tool for intensification of land utilization.

INTRODUCTION

Up until recently there were no communal farmers involved in commercial horticulture in a major way in Zimbabwe except in the communal irrigation schemes in Manicaland such as Nyanyadzi, Mutema and Tawona. These farmers have been growing mainly tomatoes for the canning plants in Mutare.

With the advent of independence the Government of Zimbabwe (GOZ) set as a national goal, the introduction of communal farmers into small-scale horticulture as a means of strengthening their income generating capacity. Two projects were launched in 1986 for this purpose: one in Manicaland and the other in Mashonaland East. Funding was obtained from the European Economic Community. In Manicaland, emphasis was placed on coffee and fruit production while in Mashonaland East it was on vegetables. Altogether more than 6 000 communal farmers are involved.

RESOURCE AVAILABILITY AND UTILISATION

Land

In most communal areas of Zimbabwe there is serious pressure on land which is used for human settlement, cropping and grazing. In the areas where our projects are situated i.e. the Honde-Pungwe and the Rusitu Valleys, we have carried out surveys over the past eight years which indicate serious and increasing shortages of arable land due to rapid population growth. In these areas communal arable land plots vary in size from less than one ha to over 60 hectares with an average landholding of only 1.5 ha. The larger landholdings are the exception rather than the rule as they make up less than 1% of the total land holdings. Most of them tend to be found at the boundaries between the communal areas and national parks or the border with Mozambique where human settlement is relatively recent. Table 1 shows the results of a survey carried out in the Honde Valley in 1992.

Table 1: Distribution of landholding sizes in Honde Valley

Landholding sizes (ha)	%
<1	17
1.0–1.6	43
1.7–2.3	17
2.4–3.0	7
3.1–5.1	6
5.2–10.0	9
>10.0	1
TOTAL	100

In the Rusitu Valley there is similar land pressure, with farm sizes ranging from 1.2 to over 20 ha with a mean of 1,3 ha.

Table 2: Project beneficiary profiles

Name of farmer	Size of land-holding	Crops grown (in hectares)						Family Size		Hired labour (L. days/yr)	Gross farm income per year
		Tea	Avocado	Banana	Citrus	P/apples	Maize	No of adults	No. of children		
1. Mwaiyana	2.5 ha	0	0.2	0.3	0.4	0.6	1	2	5	105	$ 4 700.00
2. Zikuyumo	3.4 ha	0	0	0.4	0.5	0	2.5	2	2	60	$ 1 200.00
3. Muzamana	11.0 ha	0	0	1	0.2	7	2.8	4	8	121	$30 000.00
4. Ndlovu (Cuba)	3.5 ha	0	0	1.5	1	1	0	8	1	242	$20 000.00
5. Mpembe	4.4 ha	0	0	2	0.4	1	1	2	1	0	$16 000.00
6. L. Chidavaenzi	2.5 ha	0.2	0	0.3	0.5	0	1.5	13	15	0	$ 9 850.00
7. Muyambo	3.1 ha	0.2	0	1	0.5	0.4	1	2	6	300	$16 000.00

Communal farmers in these high rainfall areas have responded to the shortage of land by intensifying their cropping systems. The major food crops grown are maize, sugar beans, finger millet, rice, groundnuts and yams while the major cash crops are coffee, tea, bananas, sugar beans, maize, cotton and vegetables.

Some typical project beneficiary profiles are given in Table 2.

Vegetable gardens and homesteads are sometimes situated in areas that are technically considered not cultivable such as old gullies.

The mixing of two or more crops in the same piece of land is common. The reasons given by the farmers for this practice are:

- to maximize land use (30 %)
- to cut labour costs (19 %)

These results also indicate that communal farmers in these areas are aware of the scarcity of both land and labour and that, faced with such conditions, they are quite capable of responding in the most rational way possible.

The ADA Manicaland approach from the outset was to encourage farmers to intercrop the perennial crops with annual crops such as sugar beans and groundnuts for the following reasons:

- to maximize land use
- to reduce soil erosion

To some extent the farmers's purpose for intercropping coincides with our view regarding maximization of land use but it seems that, to them, the possible reduction of soil erosion by planting cover crops under the perennial crops had not been appreciated. Judging by their insight, it seems reasonable to assume that with the training they are currently receiving from project staff on resource conservation and modern crop production techniques, they can quickly grasp this phenomenon.

Water

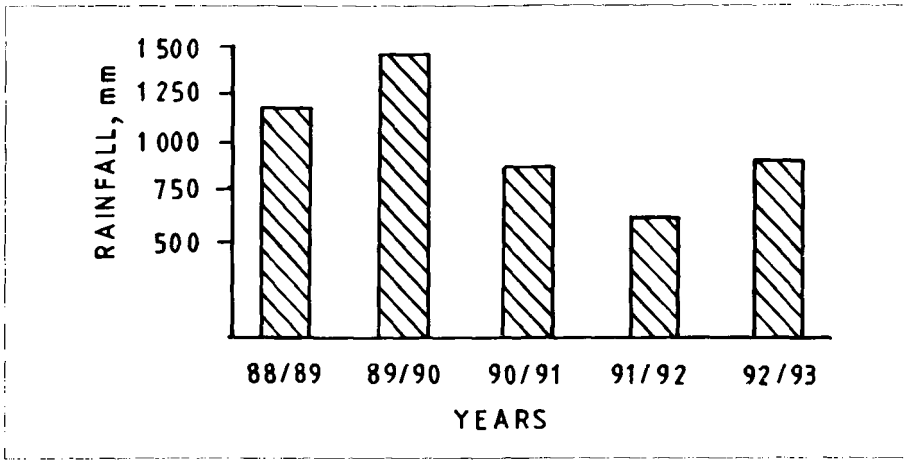
All farming depends on water. The communal areas of Zimbabwe in general and the ARDA project areas in particular are not an exception to this requirement. When these projects were conceived and designed it was assumed that the production of fruit and coffee in the project areas, which had a long term average annual rainfall of more than 2 000 mm, would rely heavily on rainfall. The droughts of 1987/88, 1990/91 and the latest and worst (to date) drought of 1991/92 have put this assumption under severe scrutiny by all concerned. For example the rainfall pattern in the Honde-Pungwe Valley since 1988/89 is shown in Figure 1.

However in the original project designs and plans, irrigation was not ruled out. As a result, as from last year (1993) we began to look at the irrigation option for coffee and fruit quite seriously and we are currently working hand in hand with the project beneficiaries on the construction of micro-irrigation schemes in both the Honde-Pungwe and Rusitu Valleys.

In the Honde-Pungwe Valley we are currently working on a 40 ha irrigation scheme at Runde whilst in the Rusitu Valley 10 micro-irrigation schemes covering a total area of 54 hectares have been completed whilst 3 schemes covering an area of approximately 97 hectares are currently being worked on.

The use of irrigation water by communal farmers presents several problems. Because resources in communal areas are owned by all and sundry, their usage usually

Figure 1: Rainfall figures for Ruda (Honde-Pungwe Valley)



Source: Agritex, Ruda

brings about controversies regarding shared use. The major problem is associated with the movement of water from the source to the point of use, as invariably under the crowded conditions of communal areas water for any scheme has to pass through someone else's piece of land. This means that when it comes to water usage any sectoral project such as ours has to accommodate more people than originally intended as co-operation among the local residents is vital for the successful operation of a communal irrigation scheme. It is mainly for this reason that the project implementer has to build as much flexibility as possible into any land use system that he may plan. He must take into account the farming preferences and priorities of all the people residing around the scheme regardless of whether they were supposed to be project beneficiaries or not.

The goals of our projects were identified jointly between the consultants who designed the project, the project beneficiaries and Government of Zimbabwe. The major goal is to enhance the income generating capacities of the project beneficiaries through the intensive commercial production of perennial cash crops such as coffee and fruit but experience to date has shown that while the beneficiaries have these as some of their purposes, they nevertheless have other purposes aimed at survival since their economies are essentially subsistence in nature. These purposes include, *inter alia*, production of food crops such as maize, beans, rice and sugar cane (which can also be sold in case of excess production) and cash crops such as cotton and various types of vegetables.

Because of this state of affairs project implementers are faced with the task of having to satisfy the needs of those communal area residents who opt to benefit from sectoral projects as well as those who are not interested. Therefore, both the project designer and implementer had better take note of these potential problems to ensure any degree of success in the implementation of any sectoral project.

Consequently we no longer believe that project management can decide which crops should be grown in the irrigation schemes being constructed, leaving this to the

beneficiaries to decide for themselves since experience elsewhere has shown that any attempt to impose these types of decisions by project implementers tends to have negative results. However, project implementers can still influence these decisions through the beneficiary institutions that they have been involved in creating.

In addition to the problems associated with the shared use of a communal resource, the communal management of these irrigation schemes has to be built in at the planning stage. Experience in our projects and elsewhere has shown that the beneficiaries of the scheme have to be fully involved if these schemes are to be successfully managed.

Labour

Contrary to the common belief that labour is abundant in communal areas, research done in the Manicaland project areas to date indicates otherwise. During the same survey referred to in Table 1 communal farmers in the Honde Valley were asked to indicate their major crop input costs for maize and for coffee (Table 3).

Table 3: Major household input costs: Percentage of respondents identifying cost items as being of major importance

Costs of production	Maize %	Coffee %
Hired labour	55	79
Pests and disease chemicals	45	98
Chemical fertilizers	94	97

These figures show that in general, hired labour made up a considerable proportion of the farming costs of the farmers.

There were, however, some differences regarding the order of importance of these major cost centres between maize and coffee. Fifty-five percent of the maize respondents said that hired labour was a major input cost whilst for coffee 79% indicated labour as a major input cost. Whilst these differences may be a result of differences in either crop preferences or priorities amongst the respondents, they nevertheless indicate the dearth of labour in these areas as quite a considerable proportion of it has to be hired. (NB the communal farmers in these areas generally do not cost their own household labour).

Given these conditions it is important to try to forecast the impact of the introduction of cash perennial crops in the communal areas of Zimbabwe. Indications are that these cash crops will compete heavily with the staple crops for labour. In addition, due to the subsistence nature of the communal area economies, other competitors for communal area labour are in the towns and the nearby large tea and coffee estates. Up until 1993 a considerable number of families in our project areas relied heavily on hired labour supplied by the Mozambicans but this source has dried up after the repatriation exercise.

It has also been our observation that these coffee growers with more than one hectare of coffee per family often struggle to cope with the crop resulting in below average productivity of the crop on such farms. On those farms with fruit crops other than coffee there are similar labour problems, particularly in banana groves where a lot of trenching, manuring, weeding and mulching are required. We, therefore, advise our project participants to establish not more than half a hectare of commercial crops

such as coffee and fruit even though some of them have long since realized the problem and responded accordingly. This advice, if followed by the farmer, is likely to result in less competition between the commercial and food crops.

THE IMPACT OF HORTICULTURAL PRODUCTION ON THE NATURAL RESOURCES IN COMMUNAL AREAS

Because of the communal method of natural resource use in the communal areas of Zimbabwe in general, and the variety of crops grown and the diversity of land use systems in the Honde-Pungwe and the Rusitu Valleys in particular, the impact of horticultural production in these areas cannot be forecast in isolation. Any attempt to do so would not give a true picture of what is likely to happen in these areas during the next couple of decades. Therefore, the likely impact of horticultural activity in the project areas has to be considered together with other agricultural activities.

Intensification of land use

The present trend towards more intensive land use systems in the project areas is inevitable due to the present rate of population growth. It is therefore necessary for any land use systems being currently planned to take this into account and to plan for minimal destruction of the natural resources. This means that land and water conservation have to be on top of the land users priority list and the planners have to take this into account during the planning process.

It is gratifying to note that our project beneficiaries have over the years developed a considerable appreciation of the need to conserve natural resources in their environment as indicated by the data in Table 4.

Table 4: Application of conservation works: percentages of farmers using different methods

Method	Maize % responses	Coffee % responses
Contour ridges	71	81
Terraces	5	45
Ridges	15	13
Basins/grass strips/mulch	5	19

These figures show that there is generally greater application of conservation works in coffee than in maize lands although the same forms of conservation are applied to both crops. It is notable that some farmers use more than one method.

The other finding of the same survey is the paucity of the general maintenance of the conservation works. This is because although labour may have been available for the initial construction of the works the farmer may find it difficult to come back to the same conservation works for regular maintenance. This further strengthens the observation made earlier on that there is a general dearth of labour in the communal areas since conservation works have a high demand for labour. The benefits of conservation work are not direct and cannot be reaped immediately so conservation work is likely to lose out to other agriculture-related chores when it comes to competition for scarce labour.

The impact of horticulture on the utilization of water is likely to be for irrigation purposes. The establishment of irrigation schemes is also likely to increase the efficiency of utilization of surface and rain water through the trapping of run-off under mulch and cover crops as well as the construction of reservoirs in the form of earth check and medium sized dams in these areas.

Because of the present excessive use and rapid deterioration of vegetation the rate of siltation of the water reservoirs and waterways is likely to increase unless corrective measures are taken now. A responsible approach to land utilization for crop production will slow down the pace of land degradation but problems associated with irrigation such as salinization are likely to increase unless preventive measures are taken at the outset. These will include, *inter alia*, good designs of drainage works as well as the growing of plants capable of absorbing large quantities of salts from the soil.

One exciting development in our project areas at present is the planting of vetiver grass *(Vertiveria zezanioides)* on top of the contour ridges. This grass has a strong and abundant root system, does not spread horizontally above or below ground, and is not palatable to either domestic or wild animals and has proved to be very useful as conservation tool. To date about a quarter of all the coffee and fruit lands have this grass on the contour ridges and already, the signs are very bright. We are, therefore, making concerted efforts to speed up the establishment of this grass in the project areas.

Our conservation strategy is to hold annual conservation competitions which run throughout the year. Our field extension staff carry out three monthly land inspections for each coffee and fruit grower, make recommendations and award conservation points which are the basis for the initial selection for the competition. Two more inspections are then carried out with the involvement of external conservation experts from ARDA, Agritex and Natural Resources Board culminating in the final competition and the awarding of prizes.

These competitions are designed in such a way that the contestants have to maintain the conservation momentum throughout the year as any slackening on the part of the candidates may cause them to fall behind in points and lose the competition at the end. So far the results are very encouraging as indicated by results of the survey (Table 4) but the present momentum has to be maintained.

Present and future trends in land use systems

Given the present scenario in communal areas, intensification of crop production together with the production of horticultural crops in communal areas is inevitable in view of the present rate of population growth and the fact that land is a limited resource. In these conditions of intensive land use, the communal farmer will find himself with no option but to conserve his land and water resources as he finds himself unable to shift his croplands with the same ease that he could in dryland and shifting cultivation systems. Therefore, intensification of land use will necessitate more and more elaborate soil and water conservation systems as well as the growing of high yielding crop varieties to compensate for the shortage of land.

Mixed cropping will also become a necessity as is already shown by the present trend. The introduction of horticultural crops in these areas will bring about a broader spectrum of crops that can in turn be used to increase the number of cropping combinations thereby increasing the productivity of the land measured on a production

tonnage per hectare per annum basis. Due to the differences in the height of tree and some annual crops, for example, different atmospheric strata can be utilized to the maximum extent. An example of such a combination which has been witnessed by the writer personally is the production of three crops; apples, green beans and pumpkins, on the same piece of land in one year.

Irrigation schemes will be a necessary component of such crop production systems but the use of irrigation systems will also necessitate an improvement in the farm management systems.

Due to its perennial nature horticultural production will compel the present smallholder farmers to apply themselves to agricultural production work throughout the year as opposed to the present situation where they are not growing any crop(s) for half the year. The availability of water throughout the year through irrigation schemes and the pressure on smallholder farmers to produce more food for the growing population will tend to accelerate this trend as long as they are convinced that their efforts are justified by acceptable prices for their produce on the market. A rising demand for food by a growing population and increasing urbanisation present bright economic prospects to the smallholder horticultural producer especially as he operates with minimal fixed costs and overheads.

CONCLUSION

The sharing of a communal resource is problematic by its nature and therefore requires a sound system of management for sustainability. The fact that the communal resources of land and water in Zimbabwe are not increasing while the population continues to increase at a daunting pace further complicates the issue.

The role horticulture can play in our communal areas under these conditions is therefore to enable our communal land users to use less land per household through intensification methods. Horticulture through its wide range of mostly high value/low volume crops is in a better position to enable us to do this than other farming systems. This is well proven by the Kenyan horticultural industry today.

In order for horticulture to enable this situation to come about, it needs to be supported by other systems i.e. irrigation schemes and improved conservation and farm management methods on a sustainable basis. This implies continued exposure of the smallholder producer to improved technology and a continued reminder that his natural resource needs to be conserved for present and future use.

READING LIST

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